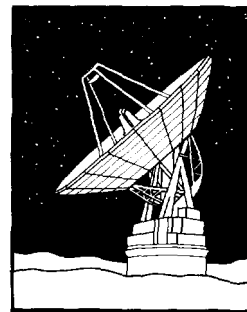


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February 17, 1993



SETI Institute
2035 Landings Drive
Mtn. View, CA 94043
(415) 961-6633
Facsimile (415) 961-7099

Ms. Donna Searcy
Secretary
Federal Communications Commission
1919 M Street, N. W.
Washington, D. C. 20554

RECEIVED

FEB 18 1993

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Dear Ms. Searcy:

Enclosed herewith are the Comments of the SETI Institute in the matter of RM
No. 8165. We hope that these Comments will be of benefit to the Commission in
its deliberations on this matter.

Sincerely yours,

Frank D. Drake
President

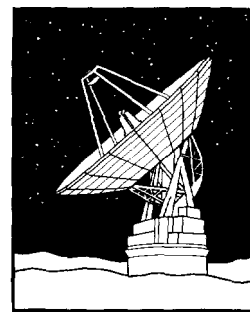
Encl: Comments of the SETI Institute

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BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION

WASHINGTON, D. C. 20554

In the Matter of)
)
Amendment of the Commission's)
Rules with Regard to the) RM No. 8165
Establishment of a Radio Astronomy)
Communications Zone in Puerto Rico)



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COMMENTS OF THE SETI INSTITUTE

I. Introduction.

The SETI Institute, a not-for-profit research institution chartered under the laws of the State of California, hereby offers its Comments on the above-captioned matter. The SETI Institute wishes to endorse strongly the establishment of a Radio Astronomy Communications Zone in Puerto Rico. We have on our staff professional radio astronomers who have been astronomical observers at the Arecibo Observatory at various times over a as much as a twenty-eight year period. Some of them have had official positions in the Observatory, including one who was Director of the National Astronomy and Ionosphere Center, which manages the Observatory, for a period of ten years.

At the present time the Institute is engaged in a major NASA project, scheduled to continue through the year 2001, which depends on observations to be made at the Observatory at various times over that period. The overall cost of this project is more than \$100 million. The observations planned for the Arecibo Observatory can not be made anywhere else in the world, since all other existing and planned radio telescopes have far less sensitivity than the Arecibo 1000-foot radio telescope.

It is to be noted that the Arecibo telescope has a radio collecting area which is about ten times larger than the collecting area of any other existing or proposed radio telescopes. Thus it will be the preeminent device for detecting very faint celestial radio signals for a minimum of ten years, and likely for a period much longer than that. It is a unique resource, especially to U. S. scientists, but also to scientists from elsewhere in the world who use it. As a national facility, it is available on the basis of the merit of proposed research to all U. S. astronomers but also to expert foreign astronomers.

In radio astronomy it is very important to have the ability to observe very weak radio emissions on a large variety of radio frequencies. This is necessary in order to understand the nature of cosmic radio sources, and to study the spectral line emissions of cosmic atoms and molecules. The radio frequencies of these natural spectral lines are a result of the physical processes in the atoms and molecules involved, of course, and are not under the control of an observer. Radio interference on a spectral line frequency can inhibit or make impossible the observation of that spectral line, and thus the greatest

possible reduction of radio interference to the radio telescope is very important. Some technological mitigation of such interference is possible, but there are not practical steps which can be taken to eliminate entirely the damage caused by such interference.

The specific project in which our Institute is involved is a comprehensive search for radio transmissions from extraterrestrial civilizations, the High Resolution Microwave Survey (HRMS) of NASA, alluded to previously. In this search the project will search for such signals on all frequencies, except where made impossible by radio interference, in the frequency band extending from 1 to 3 Gigahertz. Observations may also be made at higher frequencies, up to the upper frequency at which the telescope performs efficiently. This frequency range of good performance certainly extends to 5 Gigahertz, and possibly higher, depending on the outcome of improvements now being made to the telescope. In the HRMS we have no control on the frequency of any signals received, of course. In order to make the search as comprehensive as possible, and to maximize the chances of success in the program, all of the frequency bands just mentioned must be as free of man-made radio interference as possible. This situation, in addition to the uniquely great sensitivity of the telescope, makes it very important that all possible steps be taken to minimize radio interference at the Arecibo Observatory.

We have been notified of the comments in this matter offered by the National Academy of Sciences and by the American Astronomical Society. We concur with the comments of both of these institutions, and endorse strongly the recommendations in their comments.

II. The Research Potential of the Arecibo Observatory.

The research potential of the Arecibo Observatory has been described above, and at considerable length in the Petition of Cornell University, and in the Comments of the National Academy of Sciences. We concur with, and endorse the research opportunities as described in those documents. It is our opinion that the Arecibo Observatory deserves protection as proposed in the Petition.

III. The Commission Should Establish a Communication Zone in Puerto Rico for the Benefit of Arecibo Observatory.

The SETI Institute urges the Commission to establish a Radio Astronomy Communications Zone in Puerto Rico. Such a zone, as proposed, will have no adverse consequences on existing services in Puerto Rico. We concur fully with the detailed comments on the impact of such a zone which are contained in the Comments of the National Academy of Sciences.

Respectfully submitted,

SETI Institute

By: Frank D. Drake
Dr. Frank D. Drake
President